



## **ENGEL Provides Technology Solutions With MuCell® Core Back Expansion Molding**

**YORK, Pa. – June 23, 2009 – Molding technology leader ENGEL will exhibit a duo 1000 ton injection molding machine with MuCell® Core Back Expansion Molding for weight reduction in automotive parts at NPE2009 in Chicago, June 22-26.**

ENGEL, a world leader in the design and manufacture of injection molding machines and part-handling automation systems, is exhibiting a technology solution which provides significant reductions in part weight and cost while molding a product with an outstanding weight-to-strength ratio. This process, MuCell® Core Back Expansion Molding, will be demonstrated with the molding of a prototype door panel on an ENGEL duo 1000 US (two-platen) injection molding machine at NPE2009.

Focusing on providing technology solutions to the injection molding industry, ENGEL has partnered with Trexel Inc. to develop and commercialize MuCell Core Back Expansion Molding – a combination of the MuCell and core back molding processes. This newly-developed technology has demonstrated the potential to redesign parts in order to achieve dramatic weight savings in a series of industrial trials on structural applications like IP retainers and door panel liners. But the process combination is potentially applicable to a wide range of automotive applications.

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Steve Braig, president of ENGEL's North America operations, noted, "This process combination has excellent potential for part weight reduction, which is of particular interest to the automotive industry to meet future increased fuel efficiency requirements in vehicles. Design engineers can now rethink the mechanics on some existing applications in plastic, because dramatic weight reductions are now realistic and achievable using core back with the MuCell process." The core back process can also be used to achieve a "soft touch" material feature by using a TPE- or TPO-type resin. This process lends itself also for many automotive interior applications, and provides the end user with a "richer" feel of the primary surface plastic components.

### **Why ENGEL**

"To succeed with 'core-back,' you need precision machine technology to go along with the MuCell process," said Braig. "ENGEL's duo 1000-ton machine gives our customers the ability to precisely control both position and clamp force utilizing ENGEL's patented design concept for two platen machines. We offer the only two-platen injection molding machine (see Photo 1) that has no contact with the tie bars, allowing frictionless movement to better control speed and precision," he said.

ENGEL's duo machines also feature a patented 'Platen Parallelism Control' system, which is unique in the industry. Users can control all four corners of the mold's positioning individually which, when using the "core-back" process, allows the tool to be opened for the material expansion part of the process with complete precision – with an accuracy of 50µm / 6ms. As a result, the necessary precision for running the combined process and achieving dimensionally accurate results can be achieved.

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Photo 1. ENGEL offers the only two-platen injection molding machine that has no contact with the tie bars, allowing frictionless movement to better control speed and precision.

### **A 50 percent reduction in density yields a five-time increase in stiffness**

Core Back Expansion Molding varies from the traditional injection molding process as, once the foamed resin has filled up the mold, the volume of the mold is increased, causing the foam to expand (see Figure 1). This means stiffer plastic parts, with low density and good rigidity, can be made with lower volumes of plastic resins. The results are not only a weight savings, but a lower cost part as well. The weight savings derive from the ability to redesign parts based on high density reductions (expansion of 50 percent or more) and the resulting increased stiffness to weight ratios.

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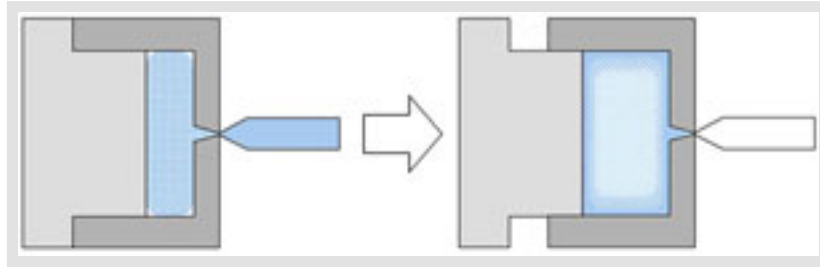


Figure 1. Molten resin infused with the supercritical fluid foaming agent via the MuCell process is injected into a thin mold where it expands quickly to fill the mold (left). After a certain period of time, the back of the mold is partially extracted (core back) to form the multi-layer structure that can be much thicker, but less dense (right).

“When you combine core back and the MuCell process,” said David Bernstein, president of Trexel, “you can essentially saturate the polymer with SCF, or gas in its supercritical state, while keeping the mold closed under pressure, and then precisely open the mold to get maximum expansion. You get a much thicker part, but one that is much less dense, in fact as much as 75 percent less dense.”

### **ENGEL duo**

The ENGEL duo (two-platen) machines are available from 500 to 6000 US tons and set the global standard for precision, speed, quality and reliability in large part molding. The duo offers the industry’s fastest dry cycle time along with the broadest range of features and options for two platen clamping systems, with:

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- reduced moving platen weight for shortest dry cycle times and low energy consumption
- frictionless movements due to zero contact between tie bars and platen, supplying excellent mold protection and low energy consumption
- excellent platen support and guides providing superlative platen parallelism and lower mold wear
- synchronized locking device for shortest dry cycle times
- a compact footprint

- 30 -

#### **ENGEL North America**

From facilities in the United States, Canada and Mexico, ENGEL North America provides its customers a single source for design and manufacture of injection molding machines for thermoplastics and elastomers, a full range of plastics processing technology modules and a full scope of automation solutions. With eight production plants in Europe, North America and Asia (China, Korea), subsidiaries in 17 countries and representatives in over 70 countries, ENGEL North America provides its customers the global support they need to compete and succeed with new technologies and leading-edge production systems. For more information, visit [www.engelglobal.com/na](http://www.engelglobal.com/na).

#### **About Trexel**

Trexel is the exclusive developer of the MuCell<sup>®</sup> microcellular foam technology and has an extensive portfolio of patents in the U.S., Canada, Europe, Japan, Korea, and Asia. Trexel's primary business is the supply of MuCell<sup>®</sup> Systems for the production of foamed injection molded and extruded articles. It also provides world-class engineering support, training and other services, and the equipment and components integral to the MuCell<sup>®</sup> process. In support of these activities, Trexel operates a foamed plastics development laboratory in its Woburn, MA facility, and has established a global network of exclusive manufacturing relationships to produce the company's proprietary precision engineering equipment. MuCell<sup>®</sup> support centers are located in the U.S., Germany, Japan, Hong Kong, China, Singapore, Australia and Korea. For more information, please visit Trexel at [www.trexel.com](http://www.trexel.com).

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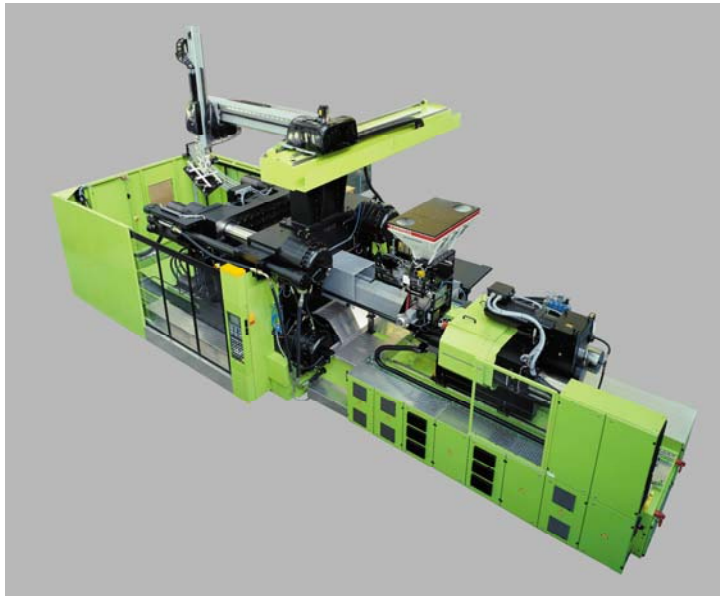


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